

I claim:

- 1 1. An optical system, comprising:
 - 2 a first micromirror array, comprising micromirrors and non-mirrored
 - 3 regions;
 - 4 a second micromirror array, comprising micromirrors and non-mirrored
 - 5 regions; and
 - 6 a ray-forming device, wherein the ray-forming device separates a light
 - 7 image into image components, wherein a first image component is received by
 - 8 the first micromirror array, a second image component is received by the second
 - 9 micromirror array, a third image component sent from the first micromirror array
 - 10 and a fourth image component sent from the second micromirror array are
 - 11 combined at the ray-forming device to produce a composite image with a perfect
 - 12 or nearly perfect fill factor.
- 1 2. The optical system of claim 1, wherein the ray-forming device is a beam
- 2 splitter.
- 1 3. The optical system of claim 1, wherein the micromirrors and the non-
- 2 mirrored regions of the first micromirror array are alternately disposed in a
- 3 checkerboard-like arrangement.
- 1 4. The optical system of claim 3, wherein the micromirrors and the non-
- 2 mirrored regions of the second micromirror array are alternately disposed in a
- 3 checkerboard-like arrangement and the second micromirror array is
- 4 complementary to the first micromirror array.
- 1 5. The optical system of claim 1, wherein each micromirror further
- 2 comprising a control and support region comprising at least a mirror support
- 3 post, support circuitry, and pads, wherein the mirror support post is disposed

4 beneath the micromirror, but the support circuitry and pads are disposed
5 beneath a non-mirrored region adjacent to the micromirror.

1 6. The optical system of claim 1, wherein the micromirrors are square in
2 shape.

1 7. The optical system of claim 1, wherein the micromirrors are circular in
2 shape.

1 8. The optical system of claim 1, wherein the ray-forming device further
2 comprises transparent surfaces and reflective surfaces, in which the transparent
3 surfaces are alternately disposed adjacent to the reflective surfaces in a
4 checkerboard-like arrangement.

1 9. The optical system of claim 1, wherein the composite image is displayed.

1 10. The optical system of claim 1, wherein the composite image is projected.

1 11. The optical system of claim 1, further comprising a birefringent crystal,
2 wherein the first image component and the second image component are
3 produced by the birefringent crystal.

1 12. The optical system of claim 1, further comprising a system of mirrors,
2 wherein the first image component and the second image component are
3 produced by the system of mirrors.

1 13. The optical system of claim 1, further comprising:
2 a third micromirror array, comprising micromirrors and non-mirrored
3 regions;

4 a fourth micromirror array, comprising micromirrors and non-mirrored
5 regions.

1 14. An optical system, comprising:
2 a first microshutter array, comprising transparent and opaque regions;
3 a second microshutter array, comprising transparent and opaque regions;
4 and
5 a ray-forming device, wherein the ray-forming device separates a light
6 image into image components, wherein a first image component is received by
7 the first microshutter array, a second image component is received by the
8 second microshutter array, a third image component sent from the first
9 microshutter array and a fourth image component sent from the second
10 microshutter array are combined at the ray-forming device to produce a
11 composite image with a fill factor of one hundred or nearly one hundred percent.

1 15. The optical system of claim 14, wherein the ray-forming device is a beam
2 splitter.

1 16. The optical system of claim 14, wherein the transparent and the opaque
2 regions of the first microshutter array are alternately disposed in a checkerboard-
3 like arrangement.

1 17. The optical system of claim 16, wherein the transparent and the opaque
2 regions of the second microshutter array are alternately disposed in a
3 checkerboard-like arrangement and the second microshutter array is
4 complementary to the first microshutter array.

1 18. A method, comprising:
2 receiving a light image into a ray-forming device;

3 separating the light image into first and second image components by the
4 ray-forming device;

5 receiving the first image component by a first micromirror array, wherein
6 the first image component is reflected off a plurality of micromirrors in the first
7 micromirror array to produce a third image component;

8 receiving the second image component by a second micromirror array,
9 wherein the second image component is reflected off a plurality of micromirrors
10 in the second micromirror array to produce a fourth image component; and

11 combining the third and fourth image components together as a
12 composite image, wherein the composite image has a substantially perfect fill
13 factor.

1 19. The method of claim 18, further comprising:

2 projecting the composite image.

1 20. The method of claim 18, further comprising:

2 displaying the composite image.

1 21. A micromirror array, comprising:

2 a non-mirrored surface, one of a plurality of non-mirrored surfaces;

3 a micromirror, wherein the micromirror is part of a plurality of
4 micromirrors which are alternately disposed with the non-mirrored surfaces in a
5 checkerboard-like pattern; and

6 a control and support region, one of a plurality of control and support
7 regions, one for each of the plurality of micromirrors, wherein each control and
8 support region comprising a micromirror support post, support circuitry, and
9 pads;

10 wherein the micromirror support post is disposed beneath the micromirror while
11 the support circuitry and the pads are disposed beneath the non-mirrored
12 surface.

1 22. The micromirror array of claim 21, wherein the micromirror is square in
2 shape.

1 23. The micromirror array of claim 21, wherein the micromirror is circular in
2 shape.